

# Ring Cusp Ion Engine

*Boeing Electron Dynamic Devices    Torrance, CA*



## TECHNOLOGY

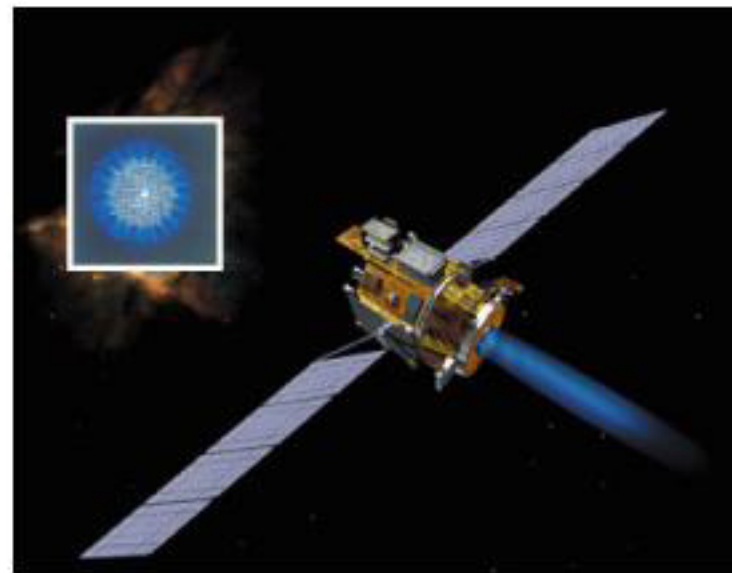
Ring cusp ion engines generate propulsion power by colliding electrons and atoms to form ions that are spewed from a vehicle to propel it. NASA and Boeing Electron Dynamic Devices have developed the engine to flight status. It has been used on seventeen commercial satellites and NASA's Deep Space 1.

## COMMERCIAL APPLICATION

- ◆ Provides station keeping and orbit raising of communication satellites and primary propulsion for deep-space spacecraft.
- ◆ The ion propulsion system can provide either reduced launch costs or increased payload and extended spacecraft lifetime for commercial satellites.
- ◆ Ion engines provide larger payloads than spacecraft with chemical propulsion and can reduce launch vehicle costs for deep-space missions.

## SOCIAL / ECONOMIC BENEFIT

- ◆ The ring-cusp concept provides long-life, high performance ion engines which yield savings of \$5 million to \$7 million per launch or payloads can be increased and commercial satellite life extended. Thus, a sizable competitive margin is produced.



***A ring cusp ion engine was used to propel the spacecraft Deep Space 1.***

## NASA APPLICATIONS

- ◆ A ring cusp ion engine was used on the Deep Space 1 spacecraft which will encounter the comet Borrelly in September 2001. The engine has accumulated over 13,000 hours of thrusting while performing primary propulsion and attitude control.